

CLASSIFICATION:

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EXHIBIT R-2, RDT&E Budget Item Justification							DATE: <b>February 2000</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA5</b>					R-1 ITEM NOMENCLATURE Ship Self Defense/0604755N					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost		137.878	130.470	85.050	60.008	67.133	59.033	63.284	CONT.	CONT.
SPS Improvement Prog / 20166/U0166/U2438		2.506	0.506	0.000	0.000	0.000	0.000	0.000	0.000	71.078
5" Rolling AirFrame Missile/20167/U0167		4.960	6.357	3.768	3.426	3.453	3.515	3.617	CONT.	CONT.
NATO SeaSparrow/ 20173/U0173		47.007	11.006	9.585	11.750	11.334	6.403	10.814	CONT.	CONT.
Shipboard EW Imp / K0954/U0954		1.730	0.000	0.000	0.000	0.000	0.000	0.000	0.000	182.028
QRCC / K2178/U2178/U2440/U2437/U2439		27.844	24.912	17.986	16.571	12.609	12.847	13.110	CONT.	CONT.
NULKA / K2190/U2190/K2441/U2441		4.752	5.835	1.097	0.557	1.059	1.076	1.105	CONT.	CONT.
AIEWS / K2309/U2309		41.812	54.296	44.024	24.978	33.825	32.771	34.638	CONT.	CONT.
IRST/U2649/22649/K2442/U2442		7.267	13.110	8.590	2.726	4.853	2.421	0.000	0.000	72.508
Volume Search Radar/32735		0.000	14.448	0.000	0.000	0.000	0.000	0.000	0.000	14.448
Quantity of RDT&E Articles		4								
<p>A. Mission Description and Budget Item Justification                      This program element consolidates currently ongoing and planned programmatic efforts related to Ship Self Defense (SSD). The consolidation facilitates effective planning and management of these efforts, exploiting the synergistic relationship inherent in each. Analysis and demonstration have established that surface SSD based on single-sensor detection, point-to-point control architecture performs marginally against current and projected Anti-Ship Cruise Missile (ASCM) threats. The supersonic seaskimming ASCM reduces the effective battle space to the horizon and the available reaction time-line to less than 30 seconds, from first opportunity to detect until the ASCM impacts its target ship. Against such a threat, multi-sensor integration is required for effective detection; parallel processing is essential to reduce reaction time to acceptable levels and to provide vital coordination/integration of hardkill and softkill assets; and improvements in terminal gun system effectiveness and in missile kinematics, control and homing accuracy are required for a successful hardkill engagement.</p>										

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EXHIBIT R-2, RDT&E Budget Item Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA5</b>	R-1 ITEM NOMENCLATURE Ship Self Defense/0604755N	
<p>These SSD projects address and coordinate the detect, control, and engage functions necessary to meet the rigorous SSD requirements within a development structure dedicated to systems engineering.</p> <p><b>(U) DETECTION:</b> Improved coordinated sensor performance to increase the probability of detecting low altitude, low observable targets is to be achieved through the synergism gained from the integration of dissimilar sensor sources. Multi-sensor integration is being addressed through the efforts of Quick Reaction Combat Capability (QRCC) (K2178), while sensor improvements are addressed through the SPS Improvements (20166), Infrared Search and Track (K2442), Shipboard Electronic Warfare Improvements (K0954) and Advanced Integrated Electronic Warfare System (K2309) projects. These improvements to both active and passive detection capabilities are complementary to the ship signature reduction technology also being pursued through Shipboard EW (K0954).</p> <p><b>(U) CONTROL:</b> Multi-sensor integration, parallel processing and the coordination of hardkill/softkill capabilities in an automated response to the ASCM threat are the cornerstones of Ship Self Defense System (SSDS) being developed through QRCC (K2178) efforts. In addition, that project provides for the central system engineering management of SSD developments, including efforts required to integrate SSDS with the Advanced Combat Direction System (CDS) for those ships having a CDS.</p> <p><b>(U) ENGAGEMENT:</b> Both missile and terminal gun system improvements necessary to meet their requirements are being addressed via NATO Seasparrow Missile System (N</p>		

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EXHIBIT R-2, RDT&E Budget Item Justification

DATE:

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APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

**RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA5**

Ship Self Defense/0604755N

B. Program Change Summary:

	FY 1999	FY 2000	FY 2001
FY 2000 President's Budget:	134.841	96.580	56.909
Appropriated Value:	156.665	130.480	
Adjustment to FY 1999/2000 Appropriated Value/ FY 2000 President's Budget:	-18.787	-0.010	28.141
FY 2001 President's Budget Submit:	137.878	130.470	85.050

Funding:

FY99: Change due to transfer of Multifunction Radar (U2348) to DD-21 program line (\$-35.573); increases for NATO SeaSparrow (\$+16.672), QRCC JSIMS development (\$-1.855), realignment of NTACMS funds to RAM (+867), QRCC CVN-68 integration (\$+3.993), below threshold reprogramming (+\$1.485); and Congressional Undistributed Adjustment (\$-4.376).

FY00: Change due to minor pricing adjustments (-\$0.010).

FY01: Change due to increases to AIEWS for program development (\$+13.118) and UYQ-realignment (\$+13.300); increase for QRCC CVN-68 integration (\$+3.000); and minor pricing adjustments (\$-1.277).

Schedule: Not applicable.

Technical: Not Applicable.

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>	<b>SHIP SELF DEFENSE 0604755N</b>			SPS Improvement Program/20166/U0166/U2438						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		2.506	0.506	0.000	0.000	0.000	0.000	0.000	0.000	71.078
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: This program develops and tests performance and reliability upgrades for search radar equipment to meet the evolving threat.</p> <p>1. (U) FY 1999 PLAN:            - (U) (\$2.506) Completed AN/SPQ-9B Light-Weight Antenna ORDALT development. Conducted Developmental Testing (DT) at NSWC Port Hueneme. Conducted Developmental Testing aboard DD-963 class ship.</p> <p>2. (U) FY 2000 PLAN:            - (U) (\$0.506) Complete Developmental/Operational Testing and make any necessary corrections to support the FY00 Milestone III production decision.</p>										

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EXHIBIT R-2a, RDT&E Project Justification						DATE:		<b>February 2000</b>																					
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER																							
<b>RDT&amp;E, N/BA5</b>		<b>SHIP SELF DEFENSE 0604755N</b>				SPS Improvement Program/20166/U0166/U2438																							
<p>B. Other Program Funding Summary</p> <table border="0"> <thead> <tr> <th></th> <th><u>FY 1999</u></th> <th><u>FY2000</u></th> <th><u>FY2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th><u>FY 2004</u></th> <th><u>FY2005</u></th> <th>To <u>Complete</u></th> <th>Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>OPN LINE 511000 (AN/SPQ-9B)</td> <td>30.957</td> <td>5.842</td> <td>18.287</td> <td>27.445</td> <td>40.186</td> <td>25.179</td> <td>28.660</td> <td>CONT.</td> <td>CONT.</td> </tr> </tbody> </table> <p>C. Acquisition Strategy: AN/SPQ-9B Radar is a directed sole source contract to Northrop Grumman Norden Systems for LRIP, and upon successful completion of TECHEVAL/OPEVAL in FY00, entering into Full Rate Production.</p> <p>D. Schedule Profile: See attached.</p>											<u>FY 1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>	OPN LINE 511000 (AN/SPQ-9B)	30.957	5.842	18.287	27.445	40.186	25.179	28.660	CONT.	CONT.
	<u>FY 1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>																				
OPN LINE 511000 (AN/SPQ-9B)	30.957	5.842	18.287	27.445	40.186	25.179	28.660	CONT.	CONT.																				

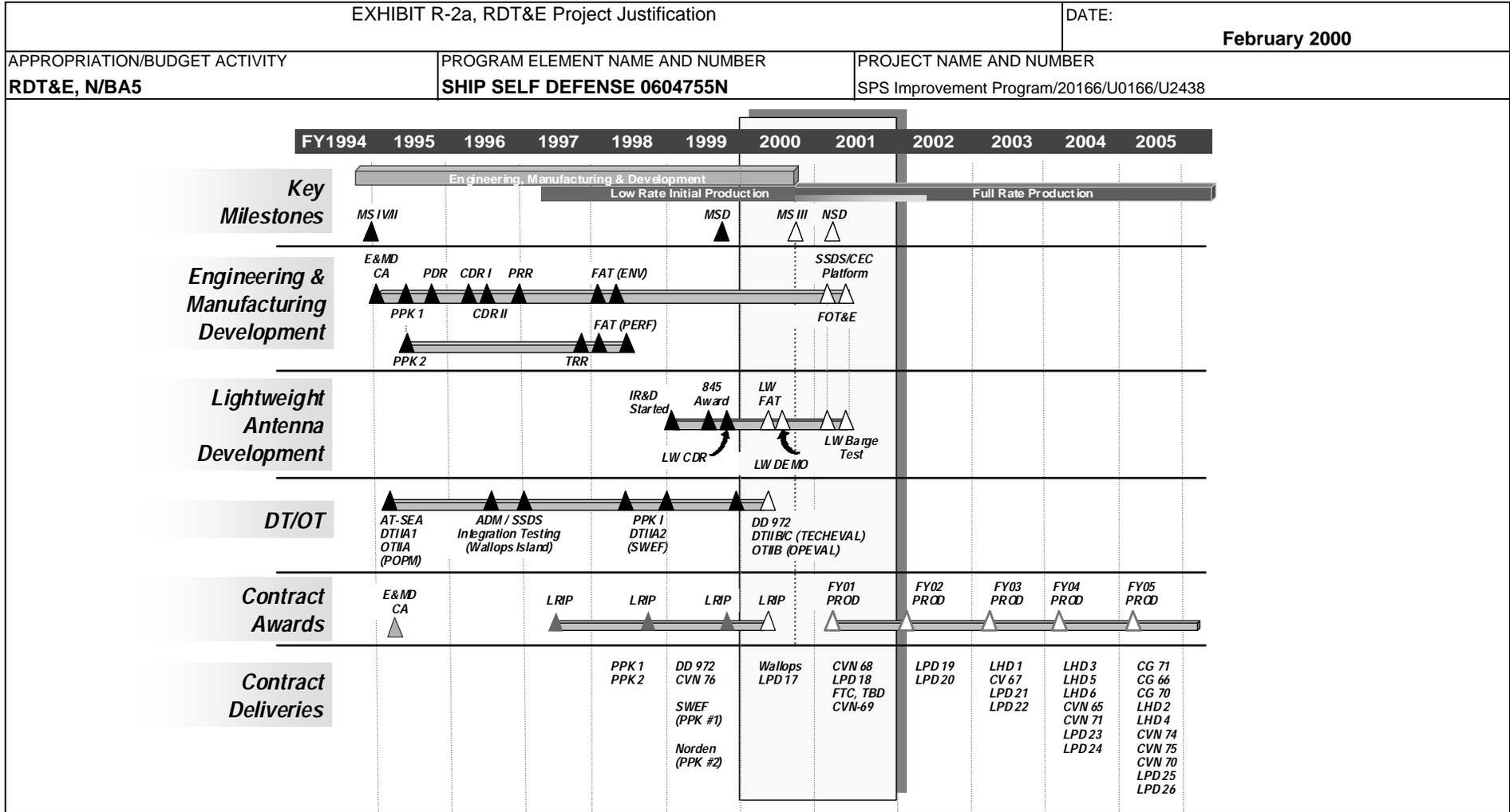
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**Exhibit R-2a, RDT&E Project Justification**  
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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			SPS Improvement Program/20166/U0166/U2438						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPAF	NGNS, Melville, NY	35.084	2.356	12/98	0.356	12/99	0.000	N/A	0.000	37.796	37.796
Primary Hardware Development	FFP	*ITT/G, Van Nuys, CA	7.000	0.000	10/98	0.000	N/A	0.000	N/A	0.000	7.000	7.000
Subtotal Product Development			42.084	2.356		0.356		0.000		0.000	44.796	44.796
Remarks: *Development cost of AN/SPS-48 Transmitter.												
Development Support Equipment												
Software Development	WR	PHD NSWC, CA	5.935	0.025	10/98	0.025	10/99	0.000	N/A	0.000	5.985	5.985
Training Development		Various	2.112	0.000		0.000					2.112	2.112
Integrated Logistics Support	WR	Various	2.072	0.020	10/98	0.020	10/99	0.000	N/A	0.000	2.112	2.112
Configuration Management	PD/WR	Various	6.520	0.030	10/98	0.030	10/99	0.000	N/A	0.000	6.580	6.580
Technical Data	WR	Various	3.140	0.015	10/98	0.015	10/99	0.000	N/A	0.000	3.170	3.170
Subtotal Support			19.779	0.090		0.090		0.000		0.000	19.959	19.959
Remarks: Various Activities includes PHD NSWC, NRL, NSWC/CD, and APL												

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Exhibit R-2a, RDT&E Project Justification  
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Exhibit R-3 Cost Analysis (page 2)							DATE: <b>February 2000</b>					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			SPS Improvement Program/20166/U0166/U2438						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DT&E	WR/RC	PHD NSWC, CA	1.665	0.000		0.000		0.000		0.000	1.665	1.665
DT&E	WR	NRL, Washington, DC	1.233	0.000		0.000		0.000		0.000	1.233	1.233
OT&E	WR/RC	PHD NSWC, CA	0.560	0.000		0.000		0.000		0.000	0.560	0.560
OT&E	WR	NRL, Washington, DC	0.410	0.000		0.000		0.000		0.000	0.410	0.410
Subtotal T&E			3.868	0.000		0.000		0.000		0.000	3.868	3.868
Remarks:												
Cost Categories												
MANAGEMENT												
Miscellaneous	Various	Various	2.335	0.060	11/98	0.060	11/99	0.000		0.000	2.455	2.455
Subtotal Management			2.335	0.060		0.060		0.000		0.000	2.455	2.455
Remarks:												
Total Cost			68.066	2.506		0.506		0.000		0.000	71.078	71.078
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification						DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER					
<b>RDT&amp;E, N/BA5</b>	<b>SHIP SELF DEFENSE 0604755N</b>				5" ROLLING AIRFRAME MISSILE/20167/U0167					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		4.960	6.357	3.768	3.426	3.453	3.515	3.617	Continuing	Continuing
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: The purpose of this program is to develop a surface-to-air self-defense system utilizing a dual mode, passive Radio Frequency/Infrared 5" Rolling Airframe Missile. The baseline system provided a self-defense capability against active radar-guided anti-ship missiles and was developed on an equal cost share basis with the Government of the Federal Republic of Germany. This effort will provide a capability against passive anti-ship missiles, very low altitude missiles, and maneuvering missiles through the incorporation of an infrared all-the-way mode seeker and improved fuze. This system is designed to counter anti-ship cruise missile raids and other threats to provide for ship survivability with accurate terminal guidance, proven lethality, and no shipboard post launch dependence.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> <li>- (U) (\$4.763) Continued Tech Eval (DT-IIC)/OPEVAL (OT-IIC).</li> <li>- (U) (\$0.197) Developed Helo, Air, Surface (HAS) Missile Algorithms; conducted Captive Carry and Simulation Efforts.</li> </ul> <p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none"> <li>- (U) (\$5.082) Refine HAS Missile Algorithms, conduct SSDS Integration, and continue Simulation Efforts and Engineering Tests.</li> <li>- (U) (\$.207) Upgrade the existing RAM/External Designation System Interface for AEGIS.</li> <li>- (U) (\$.577) Test TAS OCP upgrade.</li> <li>- (U) (\$.491) Correct OPEVAL deficiencies.</li> </ul>										

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>																																
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER																																		
<b>RDT&amp;E, N/BA5</b>		<b>SHIP SELF DEFENSE 0604755N</b>			5" ROLLING AIRFRAME MISSILE/20167/U0167																																		
<p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none"> <li>- (U) (\$2.021) Continue Integration Testing, Simulation Efforts and conduct HAS Flight Testing.</li> <li>- (U) (\$.679) Continue the RAM/EDS Interface for AEGIS.</li> <li>- (U) (\$1.068) Conduct Block 1 OT-III A FOT&amp;E.</li> </ul> <p>B. Other Program Funding Summary</p> <table border="1"> <thead> <tr> <th></th> <th><u>FY 1999</u></th> <th><u>FY2000</u></th> <th><u>FY2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th><u>FY 2004</u></th> <th><u>FY2005</u></th> <th>To <u>Complete</u></th> <th>Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>OPN LINE 523800 (RAM)</td> <td>63.126</td> <td>39.076</td> <td>37.309</td> <td>42.165</td> <td>46.153</td> <td>60.735</td> <td>54.876</td> <td>CONT.</td> <td>CONT.</td> </tr> <tr> <td>WPN LINE 224200 (RAM)</td> <td>44.316</td> <td>45.262</td> <td>23.067</td> <td>56.670</td> <td>66.504</td> <td>86.286</td> <td>72.057</td> <td>CONT.</td> <td>CONT.</td> </tr> </tbody> </table> <p>C. Acquisition Strategy: Introduced Helo/Aircraft/Surface (HAS) Mode ECP, development in FY 1998/1999, and integration in FY 2000.</p> <p>D. Schedule Profile: See attached.</p>											<u>FY 1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>	OPN LINE 523800 (RAM)	63.126	39.076	37.309	42.165	46.153	60.735	54.876	CONT.	CONT.	WPN LINE 224200 (RAM)	44.316	45.262	23.067	56.670	66.504	86.286	72.057	CONT.	CONT.
	<u>FY 1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>																														
OPN LINE 523800 (RAM)	63.126	39.076	37.309	42.165	46.153	60.735	54.876	CONT.	CONT.																														
WPN LINE 224200 (RAM)	44.316	45.262	23.067	56.670	66.504	86.286	72.057	CONT.	CONT.																														

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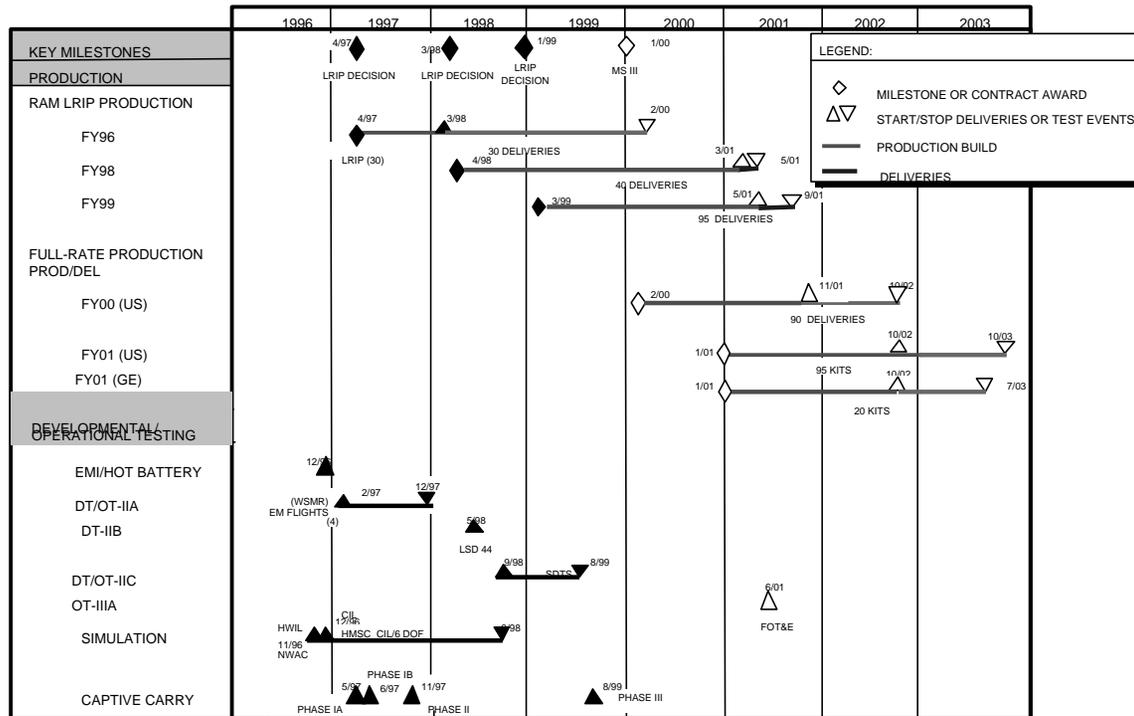
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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER 5" ROLLING AIRFRAME MISSILE/20167/U0167



### RAM PROGRAM PLAN BLOCK I DEVELOPMENT/PRODUCTION (CY)



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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			5" ROLLING AIRFRAME MISSILE/20167/U0167						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	RMSC, Tucson, AZ	58.891	0.197	04/99	0.000		0.364	11/00	Continuing	Continuing	
Ancillary Hardware Development	SS/CPFF	JHU/APL, Laurel, MD	4.888	0.650	11/98	0.536	11/99	0.150	11/00	Continuing	Continuing	
SSDS Integration	SS/CPFF	RMSC, Tucson, AZ	0.000	0.000		1.340	02/00	0.000	na	0.000	1.340	
Miscellaneous	Various	Various	227.568	1.410	11/98	0.908	11/99	0.578	11/00	Continuing	Continuing	
Subtotal Product Development			291.347	2.257		2.784		1.092		Continuing	Continuing	
Remarks: Primary Hardware Development transitions into Test & Evaluation.												
Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			<b>5" ROLLING AIRFRAME MISSILE/20167/U0167</b>						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
DT&E/OT&E/FOT&E	SS/CPAF	RMSC, Tucson, AZ	6.626	0.000		2.364	02/00	1.191	11/00	Continuing	Continuing	CONT.
DT&E/OT&E		China Lake, CA/PHD, CA	5.000	2.685	01/99	0.666	11/99	0.000	na	0.000	8.351	N/A
FOT&E		China Lake, CA/PHD, CA	0.000	0.000		0.000		1.257	11/00	0.000	1.257	N/A
Miscellaneous		Various	5.003	0.000		0.469	11/99	0.150	11/00	Continuing	Continuing	CONT.
Subtotal T&E			16.629	2.685		3.499		2.598		Continuing	Continuing	CONT.
Remarks:												
Cost Categories												
<b>MANAGEMENT</b>												
Miscellaneous	Various	Various	3.124	0.018	01/99	0.074	02/00	0.078	11/00	Continuing	Continuing	CONT.
Subtotal Management			3.124	0.018		0.074		0.078		Continuing	Continuing	CONT.
Remarks:												
Total Cost			311.1	4.960		6.357		3.768		Continuing	Continuing	CONT.
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA-5</b>		PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>				PROJECT NAME AND NUMBER NATO SEASPARROW/20173/U0173				
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		<b>47.007</b>	<b>11.006</b>	<b>9.585</b>	<b>11.750</b>	<b>11.334</b>	<b>6.403</b>	<b>10.814</b>	<b>CONT</b>	<b>CONT</b>
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification: This project encompasses three (3) primary efforts to enhance ship self defense:

- (U) EVOLVED SEASPARROW MISSILE (ESSM):** A cooperative effort among 10 NATO SEASPARROW Nations, including the U.S., to improve the capability of the SEASPARROW Missile to counter the low altitude, highly maneuverable Anti-Ship Cruise Missile (ASCM) threat. The program consists of evolving the SEASPARROW Missile through the development of a new rocket motor with tail control; thrust vector control and ordnance (warhead) upgrade; modifications to the MK 41 VLS to fire from a single cell with 4 ESSM (QuadPack); and modifications to the NATO SEASPARROW Missile System (NSSMS) to provide ESSM capability.
- (U) NATO SEASPARROW - MK 91 Rearchitecture/SDSMS:** The MK 91 Rearchitecture Program integrates NSSMS into the Ship Self Defense System (SSDS) Architecture to provide an additional layer of ship missile defense in an open architected system. This effort consists of combining the Firing Officer Console and Radar Set Console functionality into a single Advanced Display System Console (AN/UYQ-70); modifying the Signal Data Processor and eliminating the MK 157 Computer Signal Data Converter and System Evaluation and Trainer (SEAT), which cannot accommodate further upgrade; and redistributing this functionality within SSDS compatible microprocessors. This approach will eliminate the analog, point-to-point architecture, limited input-output channel and computer processing reserve deficiencies resident in the existing MK 57 NSSMS, and is required for ESSM as well as allowing for full exploitation of the capabilities of the future ESSM and provide significant reductions (over 50%) in NSSMS cost of ownership and manning.
- (U) SELF-DEFENSE LAUNCHER SYSTEM (SDLS).** FY 03 introduces the SDLS to provide designated ships, (not having a MK 41 VLS) with an affordable, lightweight, means of employing the ESSM. The operational requirement responds to the mission areas of Naval Warfare (230), Counter-Air (221), and Anti-Air Warfare (231). The general mission of ships employing ESSM is to provide both independent forward presence and to operate as an integral part of joint and allied maritime forces. The mission is to achieve a level of force protection by employing a nearly "puncture proof" ship defense capability against all varieties of anti-ship missile threats envisioned in a littoral environment. The SDLS will leverage existing technology and current development efforts including the MK 25 ESSM QuadPack canister, Commercial-Off-The-Shelf/Non-Development Items (COTS/NDI) electronics and SSDS. The system will be applicable to multiple ship classes (LHD, CVN) and will use the Navy support structure either in place or planned for the ESSM and MK 25 QuadPack canister. Use of COTS/NDI components and equipment will be maximized.

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER NATO SEASPARROW/20173/U0173
<p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY1999 ACCOMPLISHMENTS</p> <p>- (U) <b>ESSM (\$44.929):</b></p> <p>(U) (\$32.358) Reflects the increase of \$16.1M (ATR) to fund the U.S. share of the issues identified in the autopilot design and software which delayed LRIP. The remaining funds provided for continued EMD efforts at Raytheon, including S-Band capability for AEGIS/ESSM uplinks. Continued DT-IIA/OT-IIA at WSMR. Completed autopilot fixes and testing.</p> <p>(U) (\$6.460) Continued MK 41 ESSM QuadPack development effort at United Defense, Lockheed Martin and government labs. Conducted system integration testing and land based missile firings.</p> <p>(U) (\$6.111) Continued ESSM integrated product team participation and government lab engineering efforts associated with EMD. Supported development and operational tests.</p> <p>- (U) <b>NATO SEASPARROW (\$2.078):</b> Continued MK 91 software installation in Self Defense Test Ship (SDTS). Supported testing of the MK 91 Rearchitecture with RIM 7P baseline and RIM 7P++ firing.</p> <p>2. (U) FY 2000 PLAN:</p> <p>- (U) <b>ESSM (\$8.772)</b></p> <p>(U) (\$6.190) Continue EMD efforts at Raytheon, including S-Band capability for AEGIS/ESSM uplink. Conduct DT-IIC/OT-IIC on the SDTS (Oct 99-Mar 00). Conduct ESSM Aegis DT-IIB at WSMR.</p> <p>(U) (\$2.582) MK 41 QuadPack. Conduct formal testing including: Weapons control system/VLS integration with AEGIS at WSMR, LCS RegressionTest, and Barge Shock Test.</p> <p>(U) <b>NATO SEASPARROW (\$2.234):</b> Complete computer programs/integration of the MK 91 Rearchitecture on CVN/LHD Class ships. Support DT-IIC/OT-IIC on SDTS with ESSM. Address any deficiencies identified as a result of the MK 91 Rearchitecture with RIM 7P baseline.</p>		

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification							DATE:		<b>February 2000</b>	
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
<b>RDT&amp;E, N BA-5</b>		<b>SHIP SELF DEFENSE 0604755N</b>			NATO SEASPARROW/20173/U0173					
<p>2. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none"> <li>- <b>(U) ESSM (\$7.303)</b> Complete AEGIS S Band development and address deficiencies identified during the firings at WSMR (DT-IIB/OT-IIB) and on the SDTS (DT-IIC/OT-IIC).</li> <li>- <b>(U) NATO SEASPARROW (\$2.282)</b> Continue MK 91 REARCH/ICDS integration for CVN/LHD Class ships. Address any deficiencies identified as a result of CSIT testing at ICSTF, SD/Wallops Island.</li> </ul>										
B. Other Program Funding Summary										
		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
WPN BA-2 Other Missiles, Evolved SeaSparrow (ESSM) (230700)		12.641	11.625	40.001	67.281	114.910	103.471	112.865	Con't	Con't
OPN BA-4 NATO SEASPARROW (523700, 523705)		7.262	0.489	21.716	52.225	42.738	50.531	22.091	Con't	Con't
Related RDT&E:	PE 0603609N (Conventional Munitions) PE 0604307N (AEGIS Combat System Engineering) PE 0604755N (K2178 Quick Reaction Combat Capability (QRCC))									

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EXHIBIT R-2a, RDT&E Project Justification			DATE: <b>February 2000</b>																																
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N BA-5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER NATO SEASPARROW/20173/U0173																																	
<p>C. Acquisition Strategy: ESSM is a directed sole source contract to Raytheon Missile Systems Company for LRIP, and upon successful completion of TECHEVAL/OPEVAL in FY 02, entering into Full Rate Production. Multi-year full rate production is the preferred approach for the NATO SeaSparrow Consortium.</p> <p>D. Schedule Profile: As a result of the performance problem identified in the autopilot, the software required a rewrite with the potential for hardware changes.</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> </tr> </thead> <tbody> <tr> <td>Program:</td> <td></td> <td>4Q LRIP PMR</td> <td></td> <td>4Q MS III</td> <td></td> </tr> <tr> <td>Engineering:</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>T&amp;E</td> <td></td> <td>4Q DT/OT-IIB 4Q DT/OT-IIC</td> <td></td> <td>AEGIS 3Q DT-IIE/OT-IID</td> <td></td> </tr> <tr> <td>Contracts:</td> <td></td> <td>4Q LRIP CA</td> <td>2Q LRIP CA OPTION 1</td> <td>2Q LRIP CA OPTION 2</td> <td>2Q FRP CA</td> </tr> </tbody> </table>							FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	Program:		4Q LRIP PMR		4Q MS III		Engineering:						T&E		4Q DT/OT-IIB 4Q DT/OT-IIC		AEGIS 3Q DT-IIE/OT-IID		Contracts:		4Q LRIP CA	2Q LRIP CA OPTION 1	2Q LRIP CA OPTION 2	2Q FRP CA
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003																														
Program:		4Q LRIP PMR		4Q MS III																															
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T&E		4Q DT/OT-IIB 4Q DT/OT-IIC		AEGIS 3Q DT-IIE/OT-IID																															
Contracts:		4Q LRIP CA	2Q LRIP CA OPTION 1	2Q LRIP CA OPTION 2	2Q FRP CA																														

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**Exhibit R-2a, RDT&E Project Justification**  
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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N BA-5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			NATO SEASPARROW/20173/U0173						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
ESSM-Primary Hardware Development	LC/CPAF	HUGHES/RAYTHEON	91.116	29.571	10/98	4.897	10/99	2.405	10/00	2.775	130.764	CONT
		TDW	3.746							0.000	3.746	CONT
Ancillary Hardware Development	CPAF	LOCKHEED/UDLP	37.258	6.727	10/98	1.655	10/99	0.382	11/00	0.000	46.022	CONT
Systems Engineering	VARIOUS	VARIOUS	17.419	3.844		0.411	10/99	0.510	10/00	1.515	23.699	CONT
NATO-Primary Hdwe Dev		HUGHES/RAYTHEON	27.865	1.233	11/98	1.494	10/99	1.618	11/00	CONT	CONT	
Software Development		TRACOR	2.346							CONT	CONT	
Systems Engineering		VARIOUS	3.857	0.528	11/98	0.450	10/99	0.374	10/00	CONT	CONT	
Subtotal Product Development			183.607	41.903		8.907		5.289		CONT	CONT	
Remarks: FY 99 Primary Hardware Development budget includes 1415 reprogramming requested to realign \$16.672M from ESSM WPN . Note: 562k of the ATR was taken for SBIR.												
ESSM												
Integrated Logistics Support	WR	NSWC PHD	2.618	0.200	10/98	0.181	10/99	0.200	10/00	0.000	3.199	
Engr Support	WR	VARIOUS	2.297	0.626	10/98	0.097	10/99	0.200	10/00	0.528	3.748	
NATO-MK 91/SDSMS												
ENGR SUPPORT	WR	VARIOUS	4.824	0.267	10/98	0.240	10/99	0.240	10/00	CONT	CONT	
Subtotal Support			9.739	1.093		0.518		0.640		CONT	CONT	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N BA-5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			NATO SEASPARROW/20173/U0173						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC CL	2.421					1.172	10/00	0.000	3.593	
	WR	NAWC WS	2.781	0.951	10/98	0.200	10/99			0.000	3.932	
	WR	VARIOUS		1.050	10/98	0.321	10/99	0.962	10/00	4.635	6.968	
Subtotal T&E			5.202	2.001		0.521		2.134		4.635	14.493	
Remarks:												
ESSM-ENGR SPT	VARIOUS	VARIOUS	3.568	0.478	10/98	0.050	10/99	0.500	10/00	0.800	5.396	
ESSM-PM SPT	VARIOUS	VARIOUS	0.471			0.027	10/99			0.000	0.498	
ESSM-LABOR	PD/WR		1.785	0.782	VARIOUS	0.768	VARIOUS	0.782	VARIOUS	2.346	6.463	
ESSM - TRAVEL	PD/WR		0.590	0.270	VARIOUS	0.115	VARIOUS	0.185	VARIOUS	0.540	1.700	
ESSM- MISC	VARIOUS	VARIOUS	1.450	0.430	VARIOUS	0.050	VARIOUS	0.005	VARIOUS	0.015	1.950	
NATO TRAVEL/MISC	VARIOUS	VARIOUS	1.283	0.050	VARIOUS	0.050	VARIOUS	0.050	VARIOUS	CONT	CONT	
Subtotal Management			9.147	2.010		1.060		1.522		CONT	CONT	
Remarks:												
Total Cost			207.695	47.007		11.006		9.585		CONT	CONT	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>		PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>			PROJECT NAME AND NUMBER Quick Reaction Combat Capability / K2178/U2178/U2440/U2437/U2439						
COST (\$ in Millions)			FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost			27.844	24.912	17.986	16.571	12.609	12.847	13.110	Continuing	Continuing
RDT&E Articles Qty											

**A. Mission Description and Budget Item Justification**

The Quick Reaction Combat Capability (QRCC) project implements an evolutionary acquisition of improved ship self defense capabilities against Anti-Ship Cruise Missiles (ASCMs) for selected ships. The Ship Self Defense System (SSDS) is the integrating element of QRCC. The design integrates several existing stand-alone Anti-Air Warfare systems that do not individually provide the complete detection, control, and engagement capabilities needed against low flying, high speed ASCMs with low radar cross sections. The SSDS integration concept fulfills the need for an automated detection, quick reaction and multi-target engagement capability emphasizing performance in the littoral environment. SSDS replaces manual control of several self-defense systems with a single integrated capability under the computer-aided control of ship operators. System design emphasizes use of non-developmental items, commercial standards, Next Generation Computer Resources, computer program reuse and open architecture. SSDS is a physically distributed, open architecture computer network consisting of commercially available or previously developed hardware. It includes a command table that uses components of the Navy's AN/UYQ-70 standard display for human-machine interface, commercially available local area network access units and circuit cards, and commercially available fiberoptic cabling.

SSDS MK1 integrates the SPS-49A(V)1 radar, SPS-67(V)1 radar, AN/SLQ-32A electronic countermeasures system, Combat Identification, Friend or Foe-Self Defense (CIFF-SD), Rolling Airframe Missile and Phalanx Close-In Weapon System and is being installed on LSD41/49 class ships. SSDS MK1 successfully completed Operational Evaluation in June 1997. SSDS received Milestone III Approval for Full Rate Production (Mar 98) and authority to to integrate with ACDS and CEC on CV(N), LPD-17, LHD and LHA ship classes.

The distributed architecture in SSDS MK2 facilitates the incremental evolution and implementation of follow-on modifications. Development of SSDS MK2 consists of leveraging critical experiments and re-use of technology and software. SSDS MK2 is in development and will integrate other ship self defense elements, such as the AN/SPQ-9B radar, and NATO Sea-sparrow missile system with the Cooperative Engagement Capability (CEC) to improve joint interoperability. SSDS MK2 provides enhanced capabilities for Force Protection against air, surface, and subsurface threats using both ownship and remote data in support of the AAW Capstone Requirements. SSDS MK2 will also incorporate selected features of the Advanced Combat Direction System to become the integrated, coherent real time Command and Control System for Aircraft Carriers and Amphibious ships. It will: increase operational capabilities; improve combat readiness and Battle Group Interoperability; and promote standardization. It will also introduce new shipboard tactical displays and support equipment, and implement common interfaces to those used by AEGIS to facilitate transition to Common Command and Decision.

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER Quick Reaction Combat Capability / K2178/U2178/U2440/U2437/U2439
<p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. FY 1999 Accomplishments:</p> <ul style="list-style-type: none"><li>- (U) (\$13.467) Completed systems engineering required for LPD-17 and CV(N) ship classes, began computer program coding and prepared for software unit test.</li><li>- (U) (\$ 5.205) Completed engineering required for integration of hardware and computer program for LPD-17 and CV(N) ship classes and completed specifications and interface control drawings.</li><li>- (U) (\$ 5.179) Completed FOT&amp;E on Self Defense Test Ship (SDTS) in conjunction with RAM BLK1 DT/OT.</li><li>- (U) (\$ 3.993) Began integration efforts between SSDS and ACDS Block 1 for the CVN 68, USS NIMITZ, deployment.</li></ul> <p>2. FY 2000 Plan:</p> <ul style="list-style-type: none"><li>- (U) (\$12.000) Continue computer program coding and begin SSDS MK 2 unit testing and multi-element integration testing.</li><li>- (U) (\$ 6.137) Begin integration test and evaluation at Ship System Engineering Center (SSEC) Wallops Island on SSDS MK2, record program trouble reports and begin corrections.</li><li>- (U) (\$ 1.125) Prepare Integrated Logistics Support (ILS) planning and documentation updates for SSDS MK2.</li><li>- (U) (\$ .650) Support Alliance Test Network (ATN) testing for LPD's.</li><li>- (U) (\$ .500) Begin System Segment Specification (SSS) and Performance and Compatibility Requirements (P&amp;CR) for LHD ship class.</li><li>- (U) (\$4.500) Begin development integration and testing of SSDS MK2 Mod 0 for CVN 68, USS NIMITZ, deployment.</li></ul> <p>3. FY 2001 Plan:</p> <ul style="list-style-type: none"><li>- (U) (\$2.366) Continue computer program coding, unit testing and multi-element integration testing.</li><li>- (U) (\$5.280) Conduct Factory System Integration Test (FSIT) and begin Formal Qualification Test (FQT) on SSDS MK 2 computer program builds.</li><li>- (U) (\$2.626) Conduct developmental testing at SSEC Wallops Island and modify software as required.</li><li>- (U) (\$2.777) Continue documentation updates, training curriculum updates and ILS planning.</li><li>- (U) (\$3.000) Complete the development, integration efforts and deliver to CVN 68, USS NIMITZ.</li><li>- (U) (\$1.937) Begin systems engineering SSDS MK 2 computer program for LHD ship class.</li></ul>		

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER				PROJECT NAME AND NUMBER				
<b>RDT&amp;E, N/BA5</b>	<b>SHIP SELF DEFENSE 0604755N</b>				Quick Reaction Combat Capability / K2178/U2178/U2440/U2437/U2439				
B. Other Program Funding Summary									
	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	Total Cost
OPN 523900, 523905, 523906	38.604	38.574	9.352	27.722	60.715	54.495	40.538	CONT.	CONT.
O&MN 14D30 WPN Maint. QRCC	6.684	9.611	8.333	10.032	10.741	9.977	10.073	CONT.	CONT.
SCN CV(N) ship class	42.000	0	0	0	0	42.900	0	0	84.900
SCN LPD ship class	20.200	42.000	44.298	45.517	47.439	0	0	0	199.454
Related RDT&E: PE 0603755N (Ship Self Defense) PE 0604518N (Advanced Combat Direction System Blk 1) PE 0604755N (Cooperative Engagement Capability)									
C. Acquisition Strategy: Four SSDS systems were procured with OP,N for LSD class ships and a shore site in FY 99. LSD class procurement will be completed in FY 00 with the procurement of two systems. These systems will be procured under a Firm Fix Price Contract. The FY00 requirements also include 1 CVN and 1 shore base. The SSDS system will continue to undergo development and will be integrated with Advanced Combat Direction System (ACDS) and Cooperative Engagement Capability (CEC). The first integrated SSDS system procurements took place under a Cost Plus Award Fee contract in FY99 for the CVN 76, LPD 17, LPD 18 and CVN 69. Follow-on procurements for additional ships of the CV(N), LPD, LHD, and LHA classes will be made using FFP contracts.									

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER Quick Reaction Combat Capability / K2178/U2178/U2440/U2437/U2439

D. Schedule Profile:

	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05
Operational Capability	LSD							
	III					CVN / LPD / LHD / LHA		
Milestones & Reviews	▲			△	△		△	
Operational Testing		SDTS FOT&E			CVN68		FOT&E	
		OT-III A		Suitability Evaluation	OT		OT-III C	
Developmental Testing		SDTS DT-III A			LPD17 OA DT-III B/OT-III B		DT-III C	
Combat Systems Integration				CVN68 CSIT	LPD17/CVN76 CSIT			
			CVN76 Equip	LPD17 Equip	CVN68 PSA	CVN76 ELO	LPD17 ELO	LPD17/CVN76 Ship Delivery
						LPD22 Equip	CVN68 SRA	CVN77 Equip
Development	CVN / LPD / LHD / LHA							
								SSDS MK 1 SSDS MK 2

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**Exhibit R-2a, RDT&E Project Justification**  
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Exhibit R-3 Cost Analysis (page 2)								DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			Quick Reaction Combat Capability / K2178/U2178/U2440/U2437/U2439						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
<b>Developmental Test &amp; Evaluation</b>												
Developmental Test & Evaluation	WR	NSWC/PHD-Pt Hueneme CA	18.576	1.264	11/98	1.226	10/99	0.800	10/00	Continuing	Continuing	N/A
Developmental Test & Evaluation	WR	NSWC DD, Wallops Island	6.779	2.000	11/98	1.779	10/99	0.000	N/A	Continuing	Continuing	N/A
Developmental Test & Evaluation	SS/FP	JHU/APL- Laurel, MD		0.618	11/98	0.000	10/99	0.000	N/A	Continuing	Continuing	N/A
Developmental Test & Evaluation	WR	OPTEVFOR	0.430	0.103	11/98	0.149	10/99	0.050	10/00	Continuing	Continuing	N/A
Subtotal T&E			25.785	3.985		3.154		0.850		Continuing	Continuing	N/A
Remarks:												
<b>Program Management support</b>												
Program Management support			3.927	0.825	N/A	0.600	N/A	0.775	N/A	Continuing	Continuing	N/A
Subtotal Management			3.927	0.825		0.600		0.775		Continuing	Continuing	N/A
Remarks: Program management support includes travel and support services.												
Total Cost			164.556	27.844	N/A	24.912	N/A	17.986	N/A	Continuing	Continuing	N/A
Remarks:												

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**Exhibit R-3, Project Cost Analysis**  
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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>			
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>			PROJECT NAME AND NUMBER NULKA DECOY/K2190/U2190/K2441						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		4.752	5.835	1.097	0.557	1.059	1.076	1.105	CONTINUING	CONTINUING
RDT&E Articles Qty										

A. (U) Mission Description and Budget Item Justification

The Offboard Active Decoy (NULKA) is a joint cooperative program between the United States and Australia to develop an active offboard decoy which utilizes a broadband radio frequency repeater mounted atop a hovering rocket. The decoy is designed to counter a wide variety of present and future radar guided Anti-Ship Missile (ASM) threats by radiating a large radar cross section signal while flying a ship-like trajectory. The United States developed the electronic payload and fire control system. Currently the United States is completing efforts to integrate with the Ship Self Defense System (SSDS), continuing with efforts to maintain Electromagnetic Compatibility (EMC) with shipboard emitters, and continuing Advanced Integrated Electronic Warfare System (AIEWS) integration efforts. The Fire Control System components are being consolidated and modified. The MK 36 Decoy Launching System (DLS) is being modified to support NULKA launches. Australia developed the hovering rocket, launcher, and launcher interface unit.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1999 Accomplishments:

- (U) (\$2.818) Started AIEWS integration efforts.
- (U) (\$1.934) Completed EMC upgrade and conducted testing of EMC improvements.

2. (U) FY 2000 Plan:

- (U) (\$1.435) Continue AIEWS integration.
- (U) (\$4.400) Complete update of system software that programs the aerodynamic response of the NULKA decoy to specific threats when launched from specific ship classes (based on OPEVAL results); conduct at sea testing of the NULKA system in the SPY-1 AEGIS radar environment aboard a cruiser; develop a technical requirements specification for a dual band, spatially distributed IR decoy; and continue AIEWS integration.

3. (U) FY 2001 Plan:

- (U) (\$1.097) Complete AIEWS integration.

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>FEBRUARY 2000</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>		PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>			PROJECT NAME AND NUMBER NULKA Decoy/K2190/U2190/K2441/U2441				
B. (U) Other Program Funding Summary OPN Line 553000									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Complete</u>	Total <u>Cost</u>
Anti-Ship Missile Decoy System	21.920	32.265	33.814	36.514	35.182	35.622	35.644	CONT.	CONT.
C. (U) Acquisition Strategy: N/A									
D. (U) Schedule Profile: See Attached.									

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**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 27 of 44)

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EXHIBIT R-2a, RDT&E Project Justification

DATE:

**FEBRUARY 2000**

APPROPRIATION/BUDGET ACTIVITY

PROGRAM ELEMENT NAME AND NUMBER

PROJECT NAME AND NUMBER

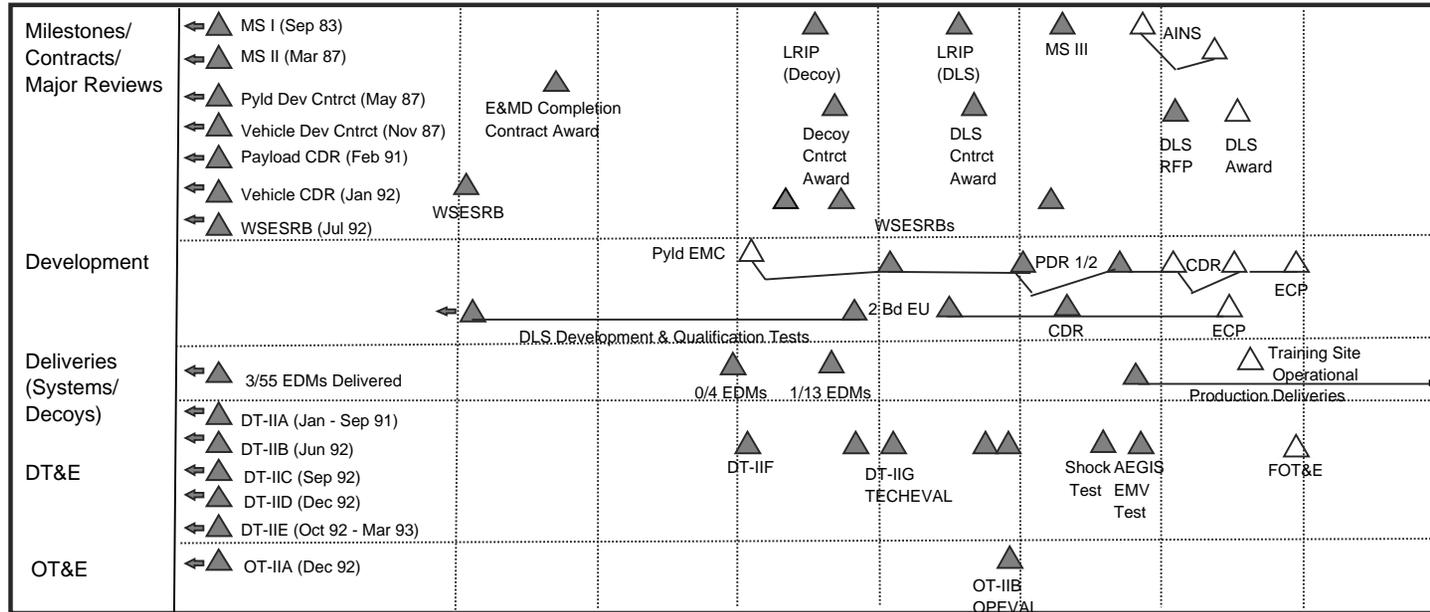
**RDT&E, N/BA5**

**SHIP SELF DEFENSE 0604755N**

NULKA Decoy/K2190/U2190/K2441/U2441

# OVERALL NULKA/MK 53 DLS SCHEDULE

FY 83 - FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
	ONDJFMAMJJAS						



94	CY 95	CY 96	CY 97	CY 98	CY 99	CY 00	CY 01
ONDJFMAMJJAS							
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
AUS FY 95	AUS FY 96	AUS FY 97	AUS FY 98	AUS FY 99	AUS FY 00	AUS FY 01	02

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Exhibit R-2a, RDT&E Project Justification

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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)							DATE: <b>FEBRUARY 2000</b>					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			NULKA Decoy/K2190/U2190/K2441/U2441						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC Crane, IN	1.874	0.376	10/98	0.610	10/99	0.328	10/00	CONT.	CONT.	N/A
	WR	NSWC Indian Head, MD	1.897	0.150	10/98						2.047	N/A
	WR	NSWC Dahlgren, VA	4.091	0.632	10/98	0.724	10/99	0.350	10/00	CONT.	CONT.	N/A
	WR	NSWC Port Hueneme, CA	0.617	0.291	10/98						0.908	N/A
	WR	NRL Washington, DC	1.780	0.893	10/98	0.100					2.773	N/A
	SS/CPFF	Sippican Boston, MA	3.492	0.100	02/99	0.700					4.292	4.292
	SS/CPFF	BAeA, Australia	3.740	1.700	04/99	0.060					5.500	5.500
	PD	NAVSUP Washington, DC	2.400	0.000							2.400	2.400
	SS/CPFF	SS/CPFF Competitive				1.690					1.690	N/A
Subtotal Product Development			19.891	4.142		3.884		0.678		CONT.	CONT.	CONT.
Remarks:												
Support and Management	CC/CPFF	Techmatics Arlington, VA	0.806	0.195	11/98	0.195	11/99	0.195	11/00	CONT.	CONT.	
Travel/Miscellaneous	Various	Various	1.750	0.393	10/98	0.206	10/99	0.224	10/00	CONT.	CONT.	
Subtotal Support and Management			2.556	0.588		0.401		0.419		CONT.	CONT.	
Remarks:												
Test & Evaluation	WR	OPTEVFOR	0.150			0.150					0.300	
	WR	NSWC Pt. Mugu, CA.	0.545	0.022		0.500					1.067	
	WR	NRL Washington, DC				0.900					0.900	
Subtotal T&E			0.695	0.022		1.550					2.267	
Total Cost			23.142	4.752		5.835		1.097		CONT.	CONT.	
Remarks:'												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA 5</b>		PROGRAM ELEMENT NAME AND NUMBER <b>Ship Self Defense / 0604755N</b>			PROJECT NAME AND NUMBER Advanced Integrated Electronic Warfare System (AIEWS)/K2309/U2309						
COST (\$ in Millions)			FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost			41.812	54.296	44.024	24.978	33.825	32.771	34.638	Cont.	Cont.
RDT&E Articles Qty											

A. (U) Mission Description and Budget Item Justification: Advanced Integrated Electronic Warfare System (AIEWS) is the next-generation Electronic Warfare (EW) system which will be an integral part of the ship combat system (AEGIS and Ship Self Defense System (SSDS)). AIEWS will be developed in two sequential increments. Increment 1 will introduce advanced Electronic Support (ES) consisting of precision Electronic Support Measures (ESM), Specific Emitter Identification (SEI) and special receiver, increased processing throughput, open architecture, a standard combat system workstation with new Human Machine Interface (HMI), decoy integration, and EMI improvements. Increment 2 will introduce both Radio Frequency (RF) and Infrared (IR) advanced Electronic Attack (EA) capabilities. This development will support both backfit and forward fit. The Engineering and Manufacturing Development (EMD) prime contract includes EDMs to be used for multiple purposes: factory qualification tests, Landbased Testing (LBT) and Operational Assessment (OA), Wallops Island B/L 7 and 6 and SSDS combat system development testing, Combat System Engineering Development System (CSEDS) testing and TECHEVAL/OPEVAL.

(U) Program Accomplishments and Plans:

(U) FY1999 ACCOMPLISHMENTS:

- (U) (\$31.289) Continued AIEWS Increment 1 EMD prime contract to include receiver, SEI, precision ESM, and logistics. Conducted Preliminary Design Review (PDR) and commenced incremental Critical Design Review (CDR); Lab/Field Activity support included.
- (U) (\$9.132) Continued Control and Processing (CAPS) software development.
- (U) (\$0.791) Continued development of Increment 1 logistics efforts.
- (U) (\$0.600) Initiated EW Roadmap study to optimize and ensure compatibility of onboard (RF/IR) countermeasures with offboard (RF/IR) countermeasures for Increment 2.

(U) FY2000 PLAN:

- (U) (\$42.271) Continue AIEWS Increment 1 EMD prime contract; continue/complete incremental CDR; Lab/Field Activity support included.
- (U) (\$9.680) Continue CAPS software development.
- (U) (\$0.645) Continue development of Increment 1 logistics efforts.
- (U) (\$0.900) Continue EW Roadmap Study.
- (U) (\$0.550) Begin test and evaluation efforts to support engineering, development and operational testing.
- (U) (\$.250) Plan combat systems integration efforts including SSDS/GCCS(M) and LAMPS/SH-60R.

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EXHIBIT R-2a, RDT&E Project Justification							DATE:		<b>February 2000</b>																															
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER																																			
<b>RDT&amp;E, N/BA 5</b>		<b>Ship Self Defense / 0604755N</b>			Advanced Integrated Electronic Warfare System (AIEWS)/K2309/U2309																																			
<p>(U) FY2001 PLAN:</p> <ul style="list-style-type: none"> <li>- (U) (\$25.471) Continue AIEWS Increment 1 EMD prime contract; Build EDMs; Lab/Field Activity support included.</li> <li>- (U) (\$5.650) Continue CAPS software development.</li> <li>- (U) (\$0.753) Continue development of Increment 1 logistics efforts.</li> <li>- (U) (\$1.600) Continue test and evaluation efforts to support engineering, development and operational testing.</li> <li>- (U) (\$10.550) Start combat system integration efforts including SSDS/GCCS(M) and LAMPS/SH-60R.</li> </ul> <p>B. (U) Other program Funding Summary</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: center;"><u>FY1999</u></th> <th style="text-align: center;"><u>FY2000</u></th> <th style="text-align: center;"><u>FY2001</u></th> <th style="text-align: center;"><u>FY2002</u></th> <th style="text-align: center;"><u>FY2003</u></th> <th style="text-align: center;"><u>FY2004</u></th> <th style="text-align: center;"><u>FY2005</u></th> <th style="text-align: center;">To <u>Complete</u></th> <th style="text-align: center;">Total <u>Cost</u></th> </tr> </thead> <tbody> <tr> <td>OPN 231300</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">14.060</td> <td style="text-align: center;">60.201</td> <td style="text-align: center;">45.054</td> <td style="text-align: center;">CONT</td> <td style="text-align: center;">CONT</td> </tr> <tr> <td>AIEWS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>C. (U) Acquisition Strategy: The AIEWS program awarded its Increment 1 EMD Cost Plus Award Fee (CPAF) contract based on best value as a result of a full and open competition. Included in the contract were phased price options for Increment 1 LRIP and production. Other options include Increment 2 EMD and LRIP for RF and IR countermeasures. Options for full contractor support including Direct Vendor Delivery (DVD), Software Support Activity (SSA) and engineering services are also part of the contract. A special receiver capability (High Gain/High Sensitivity) will be separately procured; contractual preparation will be initiated in FY00.</p> <p>D. (U) Schedule Profile: See attached schedule.</p>												<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>	OPN 231300	0	0	0	0	14.060	60.201	45.054	CONT	CONT	AIEWS									
	<u>FY1999</u>	<u>FY2000</u>	<u>FY2001</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>	<u>FY2005</u>	To <u>Complete</u>	Total <u>Cost</u>																															
OPN 231300	0	0	0	0	14.060	60.201	45.054	CONT	CONT																															
AIEWS																																								

R-1 SHOPPING LIST - Item No. 123 - 31 of 123 - 44

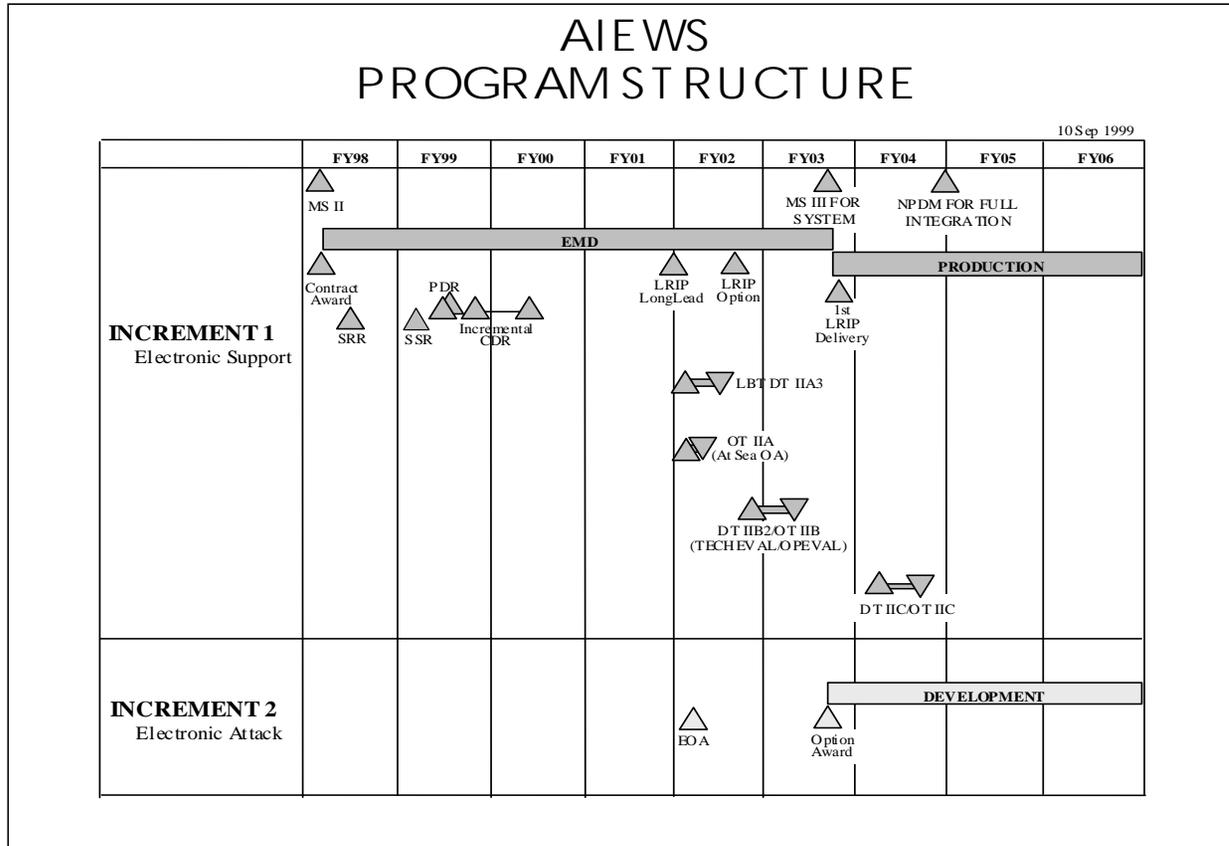
**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 31 of 44)

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA 5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>Ship Self Defense / 0604755N</b>	PROJECT NAME AND NUMBER Advanced Integrated Electronic Warfare System (AIEWS)/K2309/U2309



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Exhibit R-2a, RDT&E Project Justification  
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Exhibit R-3 Cost Analysis (page 1)								DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA 5</b>			<b>Ship Self Defense / 0604755N</b>			Advanced Integrated Electronic Warfare System (AIEWS)/K2309/U2309						

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Hardware Development	C/CPAF	LMIS Syracuse NY	11.088	23.738	12/98	32.246	12/99	13.408	11/00	3.470	83.950	83.950
HGHS Development	TBD	TBD	-	-	-	-	-	3.000	01/01	13.000	16.000	TBD
Software Development	C/CPAF	DSR Fairfax VA	7.022	8.239	12/98	8.250	12/99	4.600	11/00	1.649	29.760	29.760
Systems Engineering	WR/RCP	NSWCDD	1.508	1.405	11/98	1.989	10/99	1.520	10/00	CONT	CONT	
Combat Sys Modification/Integration	Various	Various	1.140	-	N/A	0.250	03/00	10.550	11/00	CONT	CONT	
Miscellaneous	Various	Various	1.197	1.847	11/98	3.748	10/99	2.224	10/00	CONT	CONT	
Q-70 Procurement	FFP	LM/Eagan	-	0.686	07/99	0.835	03/00	-	N/A	0.000	1.521	N/A
Award Fees	C/CPAF	LM & DSR	0.691	2.246	06/00	2.030	06/00	3.255	05/01	2.265	10.487	N/A
Subtotal Product Development			22.646	38.161		49.348		38.557		CONT	CONT	CONT

Remarks: For LMIS and DSR, Total Cost is government estimate from rebaselining cost proposals.

Specialty Engineering												
Integrated Logistics Support												
Training												
Technical Engineering Services	WR/RCP	NRL	0.904	1.074	11/98	2.132	10/99	1.917	10/00	CONT	CONT	
Miscellaneous	Various	Various	0.768	1.777	11/98	2.065	10/99	1.607	10/00	CONT	CONT	
Subtotal Support			1.672	2.851		4.197		3.524		CONT	CONT	

Remarks:

R-1 SHOPPING LIST - Item No. 123 - 33 of 123 - 44

**Exhibit R-3, Project Cost Analysis**  
(Exhibit R-3, page 33 of 44)

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Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2000</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA 5</b>			PROGRAM ELEMENT <b>Ship Self Defense / 0604755N</b>			PROJECT NAME AND NUMBER Advanced Integrated Electronic Warfare System (AIEWS)/K2309/U2309						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Test PIng/Pre-TECHEVAL Events	WR/RCP	NSWCDD	-	0.200	01/99	0.300	10/99	0.500	10/00	CONT	CONT	
Miscellaneous	Various	Various	0.070	0.210	05/99	0.250	10/99	1.100	10/00	CONT	CONT	
Subtotal T&E			0.070	0.410		0.550		1.600		CONT	CONT	
Remarks:												
Program Management Support	Various	Vaious	0.290	0.390	10/98	0.201	10/99	0.343	10/00	CONT	CONT	
Travel												
Subtotal Management			0.290	0.390		0.201		0.343		CONT	CONT	
Remarks:												
Total Cost			24.678	41.812		54.296		44.024		CONT	CONT	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>			
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>	<b>SHIP SELF DEFENSE 0604755N</b>			Infrared Search and Track (IRST) U2442/22649/U2649/K2442						
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		<b>7.267</b>	<b>13.110</b>	<b>8.590</b>	<b>2.726</b>	<b>4.853</b>	<b>2.421</b>	<b>0.000</b>	<b>0.000</b>	<b>72.508</b>
RDT&E Articles Qty										
<p>A. (U) This project provides funding for the Infrared Search &amp; Track (IRST) System. The threat from Sea Skimming Anti-Ship Cruise Missiles (ASCMs) is increasing at a substantial rate and is impacting the Navy's force protection and battle space dominance capability. The IRST program bolsters ships force protection capabilities by providing fully integrated passive detection/declaration of Sea Skimming ASCM threats. Because IRST operates in the infrared portion of the electromagnetic spectrum, it is immune to radar countermeasures and is not affected by atmospheric anomalies such as surface based ducting. In addition, IRST provides extremely accurate and precise elevation data at the horizon that allows immediate determination of hostile intent. IRST can also free up search radar resources by providing horizon search coverage where radar performance is marginal. The IRST provides passive augmentation to complement radar, electronic support measures (ESM) and visual surveillance systems for air targets. IRST will identify those air targets to the ships' combat system.</p> <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:            1. (U) FY 1999 ACCOMPLISHMENTS:            - (U) Completed IRST Phase 1 and deliver EDM-1.            - (U) (\$ .800) Conducted at-sea data collection as part of USN/FGN joint fleet exercise.            - (U) (\$ .875) Conducted IRST/AEGIS Integration Testing at AEGIS Computer Center Dahlgren, VA, and Lockheed Martin, Orlando, FL.            - (U) (\$ .300) Completed Combat Systems Integration via CEC.            - (U) (\$ .125) Program Management Support.            - (U) Began IRST Phase 2.            - (U) (\$2.220) Began detector design and fabrication.            - (U) (\$ .400) Completed scanner design and begin fabrication.            - (U) (\$1.417) Began SPCU modifications.            - (U) (\$ .600) Began software modifications.            - (U)(\$ .480) Began algorithm and simulation modifications.            - (U) (\$ .050) Program Management Support.</p>										

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER Infrared Search and Track (IRST) U2442/22649/U2649/K2442
<p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none"> <li>- (U) (\$2.100) Complete detector design and fabrication, Begin acceptance test.</li> <li>- (U) (\$1.200) Continue scanner fabrication.</li> <li>- (U) (\$1.700) Continue SPCU Phase 2 modifications.</li> <li>- (U) (\$3.500) Continue software modifications.</li> <li>- (U) (\$1.510) Continue algorithm and simulation modifications.</li> <li>- (U) (\$2.800) Begin systems integration.</li> <li>- (U) (\$ .300) Program Management Support.</li> </ul> <p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none"> <li>- (U) (\$ .270) Complete scanner fabrication and acceptance testing.</li> <li>- (U) (\$1.670) Complete SPCU Phase 2 modifications.</li> <li>- (U) (\$1.760) Complete software modifications.</li> <li>- (U) (\$1.290) Complete algorithm and simulation modifications.</li> <li>- (U) (\$2.100) Complete Systems Integration.</li> <li>- (U) (\$1.200) Begin environmental, EMI, and Factory Acceptance Testing.</li> <li>- (U) (\$ .300) Program Management Support.</li> </ul> <p>B. Other Program Funding Summary: Not Applicable.</p> <p>C. Acquisition Strategy: Proceed to production for USN new construction ships.</p> <p>D. Schedule Profile: See attached.</p>		

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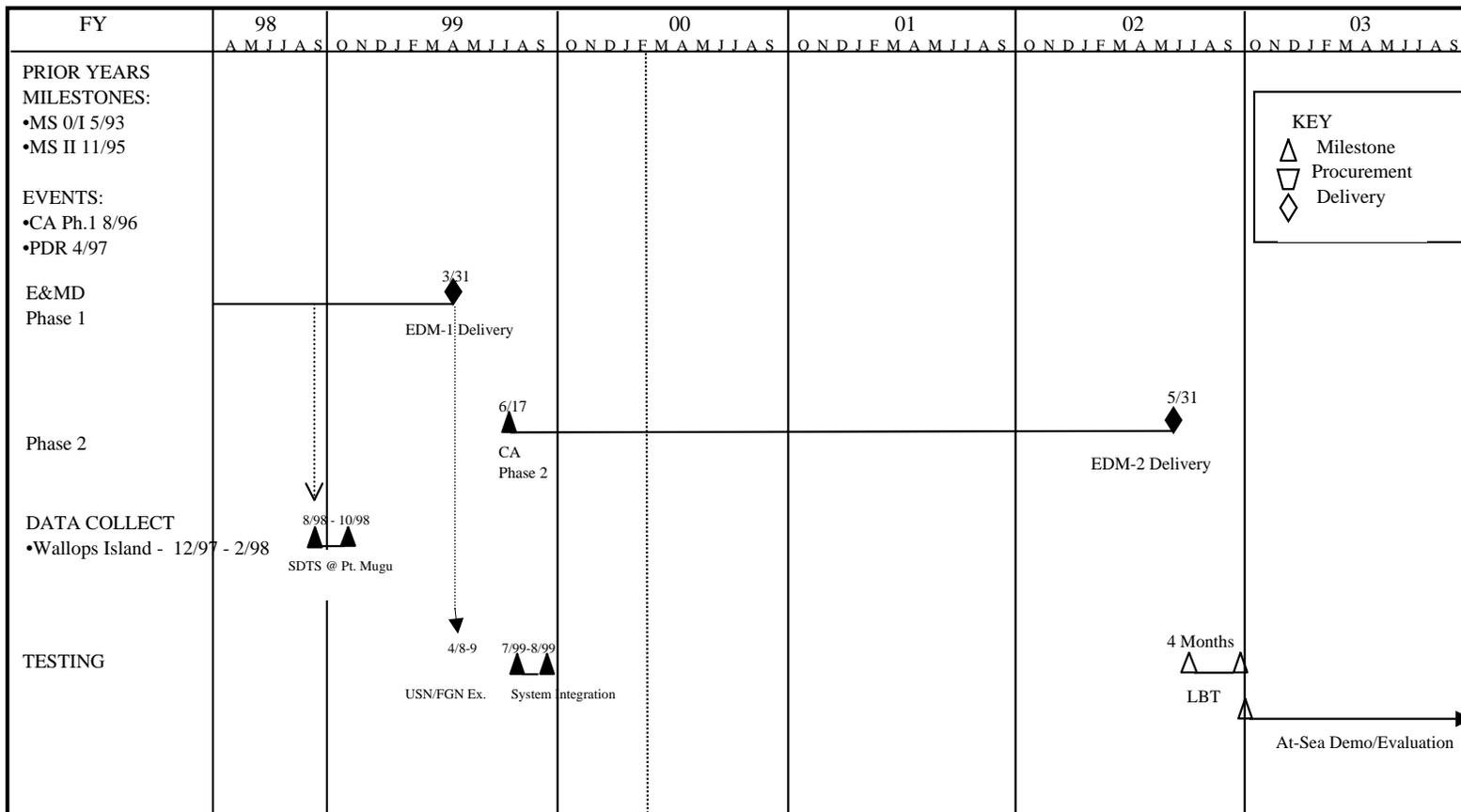
**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 36 of 44)

**UNCLASSIFIED**

CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA5</b>	PROGRAM ELEMENT NAME AND NUMBER <b>SHIP SELF DEFENSE 0604755N</b>	PROJECT NAME AND NUMBER Infrared Search and Track (IRST) U2442/22649/U2649/K2442



TIME NOW

R-1 SHOPPING LIST - Item No. 123 - 37 of 123 - 44

**Exhibit R-2a, RDT&E Project Justification**  
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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 1)							DATE: <b>February 2000</b>					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			Infrared Search and Track (IRST) U2442/22649/U2649/K2442						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	LOCKHEED MARTIN	25.593	4.037	06/99	5.000	01/00	3.140	11/00	0.000	37.770	
Ancillary Hardware Development	N/A	N/A										
Systems Engineering												
Licenses												
Tooling												
GFE												
Award Fees												
Combat Systems Integration			4.386	0.300		2.800		2.100	11/00	0.000	10.036	
Subtotal Product Development			29.979	4.337		7.800		5.240		0.000	47.806	
Remarks:												
Development Support Equipment												
Software Development		Various		1.080	Various	5.010	Various	3.050	Various	0.000	19.176	
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support			0.000	1.080		5.010		3.050		0.000	19.176	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)								DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA5</b>			<b>SHIP SELF DEFENSE 0604755N</b>			Infrared Search and Track (IRST) U2442/22649/K2442/U2649						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation		NSWC/Lockheed Martin Joint Exercise	1.500	0.800	11/98					0.000	2.300	
Operational Test & Evaluation		NSWC/Lockheed Martin, Integration Testing		0.875	11/98					0.000	0.875	
Tooling												
GFE												
<b>Subtotal T&amp;E</b>			<b>1.500</b>	<b>1.675</b>		<b>0.000</b>		<b>0.000</b>		<b>0.000</b>	<b>3.175</b>	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	Various	Various	2.062	0.120	11/98	0.240	01/00	0.240	11/00	0.000	2.662	
Travel				0.055		0.060		0.060		0.000	0.175	
Labor (Research Personnel)												
Overhead												
<b>Subtotal Management</b>			<b>2.062</b>	<b>0.175</b>		<b>0.300</b>		<b>0.300</b>		<b>0.000</b>	<b>2.837</b>	
Remarks:												
<b>Total Cost</b>			<b>33.541</b>	<b>7.267</b>		<b>13.110</b>		<b>8.590</b>		<b>10.000</b>	<b>72.508</b>	
Remarks:												

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**Exhibit R-3, Project Cost Analysis**  
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EXHIBIT R-2a, RDT&E Project Justification						DATE: <b>February 2000</b>				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
<b>RDT&amp;E, N/BA-5</b>					Volume Search Radar (VSR) / 32735					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		0.000	14.448*	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Qty		0	0	0	1	0	0	0	0.000	0.000
<p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funds for the development of the Volume Search Radar (VSR) in association with DD 21 and CVN 77. This provides applicable surface ships with an affordable, high performance air search radar. This system is based on solid state, active array radar technology and will provide search, detect, and track while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. VSR provides long range above-the-horizon surveillance and timely cueing to MFR. A Test Article will be available in FY 02 to support DT/OT land-based and at-sea testing.</p> <p>* (U) Additional FY00 funding for VSR development included in PE 0603512N, Project 42208 (Future Carrier R&amp;D) and PE 0604300N, Project 32464. All requirements in FY 2001 and beyond are consolidated in PE 0604300N, Project 32735.</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <p>Not Applicable</p>										

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**Exhibit R-2a, RDT&E Project Justification**  
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EXHIBIT R-2a, RDT&E Project Justification							DATE: <b>February 2000</b>																																											
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER																																														
<b>RDT&amp;E, N/BA-5</b>				Volume Search Radar (VSR) / 32735																																														
<p>2. (U) FY 2000 PLAN:\</p> <ul style="list-style-type: none"> <li>- (U) (\$2.448) Begin VSR Engineering and Manufacturing Development (E&amp;MD) leading toward Preliminary Design Review (PDR).</li> <li>- (U) (\$11.000) Continue Preliminary Design and conduct PDR -- scheduled for mid-year. Continue E&amp;MD Phase.</li> <li>- (U) (\$1.000) Government Engineering Services to support Radar Suite Acquisition Team (RSAT) for VSR E&amp;MD.</li> </ul> <p>3. (U) FY 2001 PLAN:</p> <p>All requirements in FY 2001 and beyond are consolidated in PE 0604300N, Project 32735.</p> <p>B. (U) OTHER PROGRAM FUNDING SUMMARY:</p> <table border="1"> <thead> <tr> <th>COST (\$ in Millions)</th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Complete</th> <th>TotalCost</th> </tr> </thead> <tbody> <tr> <td>Shipboard System Component Dev/0603513N</td> <td>99.395</td> <td>113.474</td> <td>244.437</td> <td>317.176</td> <td>239.701</td> <td>136.747</td> <td>116.371</td> <td>CONT.</td> <td>CONT.</td> </tr> <tr> <td>Carrier Systems Development/0603512N</td> <td>105.778</td> <td>141.957</td> <td>148.952</td> <td>156.631</td> <td>70.759</td> <td>76.726</td> <td>75.949</td> <td>CONT.</td> <td>CONT.</td> </tr> <tr> <td>SC-21Total Ship Systems Engineering/0604300N</td> <td>120.704</td> <td>161.116</td> <td>305.274</td> <td>303.989</td> <td>617.796</td> <td>763.620</td> <td>857.350</td> <td>CONT.</td> <td>CONT.</td> </tr> </tbody> </table> <p>C. (U) ACQUISITION STRATEGY:</p> <p>(U) In FY 2001, the Government will downselect to a single DD 21 industry team. The Full Service Contractor (FSC) will fabricate and deliver the VSR EDM in FY 2002. MFR/VSR DT/OT is anticipated in FY 2002 through FY 2004.</p>											COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost	Shipboard System Component Dev/0603513N	99.395	113.474	244.437	317.176	239.701	136.747	116.371	CONT.	CONT.	Carrier Systems Development/0603512N	105.778	141.957	148.952	156.631	70.759	76.726	75.949	CONT.	CONT.	SC-21Total Ship Systems Engineering/0604300N	120.704	161.116	305.274	303.989	617.796	763.620	857.350	CONT.	CONT.
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost																																									
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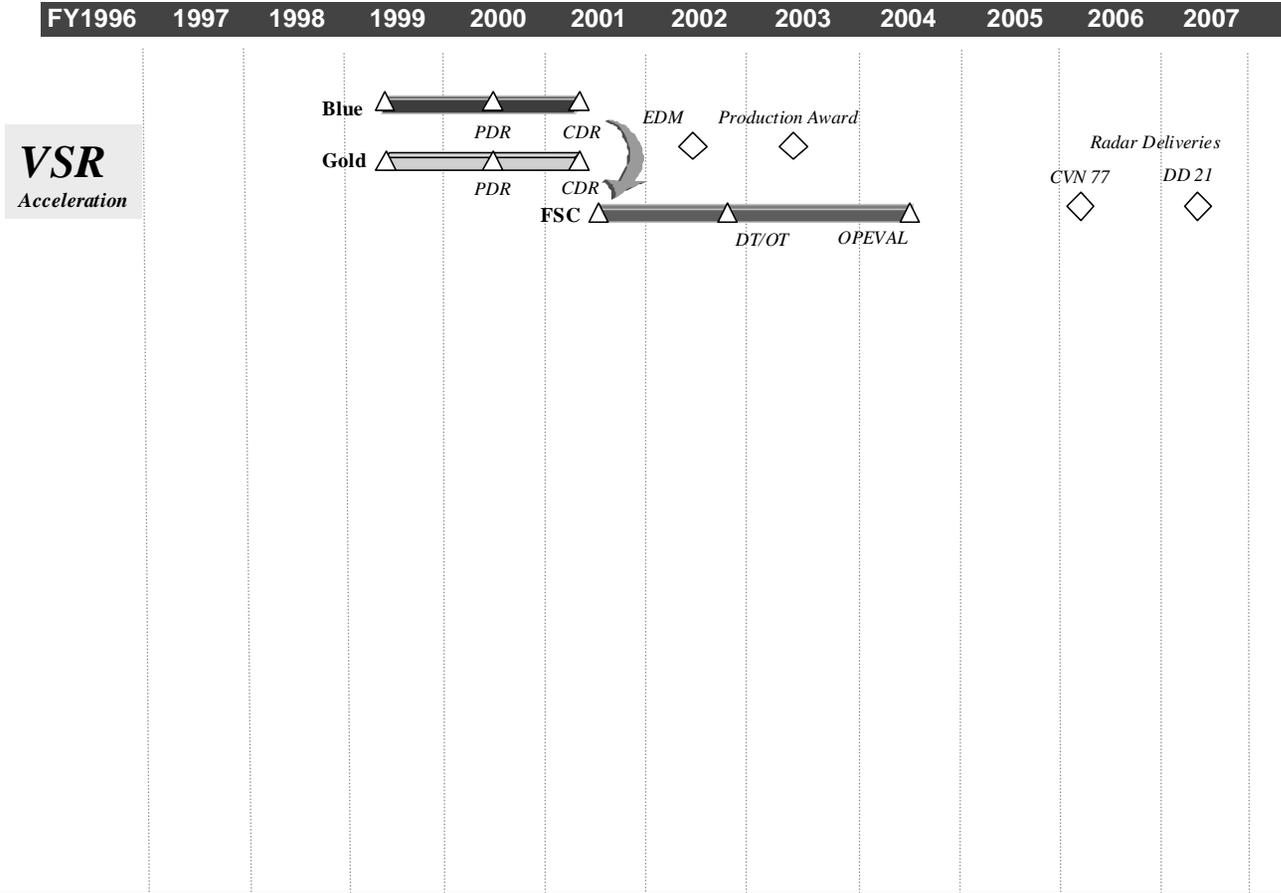
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EXHIBIT R-2a, RDT&E Project Justification		DATE: <b>February 2000</b>
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N/BA-5</b>	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER Volume Search Radar (VSR) / 32735

D. (U) SCHEDULE PROFILE:



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Exhibit R-2a, RDT&E Project Justification  
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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5						Volume Search Radar (VSR) / 32735						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Sec 845/804	DD 21 Industry Team	0.000	0.000	N/A	13.448	Various	0.000	N/A	0.000	0.000	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal Product Development			0.000	0.000		13.448		0.000		0.000	0.000	
Remarks: All requirements in FY 2001 and beyond are consolidated in PE 0604300N.												
Development Support Equipment											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)							DATE: <b>February 2000</b>					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
<b>RDT&amp;E, N/BA-5</b>						Volume Search Radar (VSR) / 32735						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: No Developmental or Operational Test and Evaluation will be conducted during FY 1999 through FY 2001.												
Government Engineering Support	WR	NSWC DD Dahlgren, VA	0.000	0.000	N/A	0.000	3QFY00	0.000	N/A	0.000	0.000	
Program Management Support	C/CPFF	Various	0.000	0.000	N/A	1.000	3QFY00	0.000	N/A	0.000	0.000	
Travel			0.000	0.000	N/A	0.000	N/A	0.000	N/A	0.000	0.000	
Subtotal Management			0.000	0.000		1.000		0.000		0.000	0.000	
Remarks:												
Total Cost			0.000	0.000		14.448		0.000		0.000	0.000	
Remarks:												

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**Exhibit R-3, Project Cost Analysis**  
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